

Chapter 17

Layer 2 Circuit Configuration

To configure a Layer 2 circuit, include statements at the [edit protocols l2circuit] hierarchy level:

```
[edit]
protocols {
    l2circuit {
        neighbor address {
            interface interface-name {
                (control-word | no-control-word);
                virtual-circuit-id identifier;
            }
        }
        traceoptions {
            file filename <replace> <size size> <files number> <nostamp>;
            flag flag <flag-modifier> <disable>;
        }
    }
}
```

The following sections describe how to configure Layer 2 virtual circuits:

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Configure the Virtual Circuit ID on page 328

Configure the Interface Encapsulation Type on page 328

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Configure the Neighbor and Interface

Each Layer 2 circuit is represented by the logical interface connecting the local PE router to the local CE router. All the Layer 2 circuits using a particular remote PE router designated for remote CE routers are listed under the neighbor statement (neighbor designates the PE router). Each neighbor is identified by its IP address and is usually the end-point destination for the LSP tunnel transporting the Layer 2 circuit.

- Configure the Virtual Circuit ID

You configure a virtual circuit ID on each interface. Each virtual circuit ID uniquely identifies the Layer 2 circuit among all the Layer 2 circuits to a specific neighbor. The key to identifying a particular Layer 2 circuit on a PE router is the neighbor address and the virtual circuit ID. An LDP-FEC-to-label binding is associated with a Layer 2 circuit based on the virtual circuit ID in the forwarding equivalence class (FEC) and the neighbor that sent this binding. It enables the dissemination of the VPN label used for sending traffic on that Layer 2 circuit to the remote CE router.

Configure the virtual circuit ID at the [edit protocols l2circuit neighbor *address* interface *interface-name*] hierarchy level:

```
[edit protocols l2circuit neighbor address interface interface-name]
    virtual-circuit-id identifier;
```

- Configure the Interface Encapsulation Type

Both ends of a Layer 2 circuit must connect using the same Layer 2 encapsulation. The Layer 2 encapsulation type is carried in the LDP FEC. The encapsulation type received from an FEC is matched against the local encapsulation type of the Layer 2 circuit. The Layer 2 circuit will not work if the encapsulation types do not match.

The configuration for the encapsulation type on Layer 2 virtual circuits is identical to the configuration for the CCC encapsulation type. For more information, see the *JUNOS Internet Software Configuration Guide: MPLS Applications*.

To configure the interface encapsulation for a Layer 2 circuit, include statements at the [edit interfaces] hierarchy level:

```
[edit]
interfaces {
    interface-name {
        encapsulation encapsulation-type;
        unit unit-number;
    }
}
```

- Configure LDP for Layer 2 Circuits

Use LDP as the signaling protocol to advertise ingress labels to the remote PE routers. When configured, LDP examines the Layer 2 circuit configuration and initiates extended neighbor discovery for all the Layer 2 circuit neighbors (for example, remote PEs). This is similar to how LDP works when tunneled over RSVP. You must run LDP on the lo0.0 interface for extended neighbor discovery to function correctly.

For detailed information about how to configure LDP, see the *JUNOS Internet Software Configuration Guide: MPLS Applications*.

Disable the Control Word for Layer 2 Circuits

The emulated VC encapsulation for Layer 2 circuits is accomplished by adding a 4-byte control word between the Layer 2 protocol data unit (PDU) being transported and the VC label that is used for demultiplexing. Various networking formats (ATM, Frame Relay, Ethernet, and so on) use the control word in a variety of ways.

JUNOS software does not support the control word for any networking format, meaning that it is not fully compliant with the Internet draft in cases where the control word is mandatory. To be minimally compliant with the Internet draft, JUNOS supports a null control word (a control word of all zeros). If JUNOS receives a packet with a control word attached, the control word is discarded before the packet is forwarded to its destination.

JUNOS can typically determine whether a neighboring router supports the control word or not. However, if you want to explicitly disable its use on a specific interface, include the no-control-word statement at the [edit protocols l2circuit neighbor *address* interface *interface-name*] hierarchy level:

```
[edit protocols l2circuit neighbor address interface interface-name]
no-control-word;
```

This statement might be required for Layer 2 VPN configurations. For more information, see “Disable the Control Word for Layer 2 VPNs” on page 22.

Trace Layer 2 Circuit Creation and Changes

To trace the creation of and changes to Layer 2 virtual circuits, you can specify options in the traceoptions statement at the [edit protocols l2circuit] hierarchy level:

```
[edit protocols l2circuit]
traceoptions {
    file filename <replace> <size size> <files number> <nostamp> <no-world-readable>
    <world-readable>;
    flag flag <flag-modifier> <disable>;
}
```

The following tracing flags display the operations associated with Layer 2 virtual circuits:

connections—Layer 2 circuit connections (events and state changes)

error—Error conditions

FEC—Layer 2 circuit advertisements received or sent using LDP

topology—Layer 2 circuit topology changes caused by reconfiguration or advertisements received from other PE routers

